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<u>L2</u>	L1 and (signal near5 pin)	155	<u>L2</u>
<u>L1</u>	(select\$4 near3 path) near10 pin	502	<u>L1</u>

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L4 L3

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L4

DB=PGPB,USPT,USOC; PLUR=YES; OP=OR

L3 L1 same (signal near5 pin)

64

L3

L2 L1 and (signal near5 pin)

155

L2

L1 (select\$4 near3 path) near10 pin

502

L1

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Terms	Documents
(439/189 439/497 439/507 439/620 439/505 174/34 361/683 361/686 361/752 361/760 709/253 710/3 710/100 710/300 710/305 710/301 710/316 710/1 710/313 710/72 710/63 340/825.52 235/462.15 714/25).ccls.	15864

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L5 710/3,100,300,305,301,316,1,313,72,63;439/189,497,507,620,505;235/462.15;361/683,686,752,7

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L4 L3

DB=PGPB,USPT,USOC; PLUR=YES; OP=OR

L3 L1 same (signal near5 pin)

L2 L1 and (signal near5 pin)

L1 (select\$4 near3 path) near10 pin

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side*DB=PGPB,USPT,USOC; PLUR=YES; OP=OR*L6 L3 and L5L5 710/3,100,300,305,301,316,1,313,72,63;439/189,497,507,620,505;235/462.15;361/683,686,752,7*DB=EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR*L4 L3*DB=PGPB,USPT,USOC; PLUR=YES; OP=OR*L3 L1 same (signal near5 pin)L2 L1 and (signal near5 pin)L1 (select\$4 near3 path) near10 pin

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12 and network

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	U	1	Document ID	Issue Date	Pages	Title	Current OR	Current XRef
1	<input type="checkbox"/>	<input type="checkbox"/>	US 6667895 B2	20031223	22	Integrated circuit device and module with integrated	365/63	257/737; 365/189.02;
2	<input type="checkbox"/>	<input type="checkbox"/>	US 6650142 B1	20031118	51	Enhanced CPLD macrocell module having selectable	326/41	326/39
3	<input type="checkbox"/>	<input type="checkbox"/>	US 6421808 B1	20020716	50	Hardware design language for the design of integrated	716/1	703/14
4	<input type="checkbox"/>	<input type="checkbox"/>	US 6058252 A	20000502	38	System and method for generating effective layout	716/10	
5	<input type="checkbox"/>	<input type="checkbox"/>	US 5799036 A	19980825	18	Computer system which provides analog audio	375/222	710/72
6	<input type="checkbox"/>	<input type="checkbox"/>	US 5774793 A	19980630	11	System and method for interfacing diversely	455/418	439/502; 439/955;
7	<input type="checkbox"/>	<input type="checkbox"/>	US 5752082 A	19980512	16	System for multiplexing pins of a PC card socket and PC	710/62	370/465; 379/93.05;
8	<input type="checkbox"/>	<input type="checkbox"/>	US 5621312 A	19970415	11	Method and apparatus for checking the integrity of a	324/158.1	
9	<input type="checkbox"/>	<input type="checkbox"/>	US 5241277 A	19930831	12	Test system for automatic testing of insulation	324/538	324/158.1
10	<input type="checkbox"/>	<input type="checkbox"/>	US 5239213 A	19930824	16	Precision timing control programmable logic device	326/38	326/41
11	<input type="checkbox"/>	<input type="checkbox"/>	US 5155432 A	19921013	31	System for scan testing of logic circuit networks	324/763	714/731

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1 Design and VLSI implementation of a novel concurrent 16-bit multiplexed accumulator for DSP applications

Poornaiah, D.V.; Haribabu, R.; Ahmad, M.O.;
Acoustics, Speech, and Signal Processing, 1993. ICASSP-93., 1993 IEEE International Conference on , Volume: 1 , 27-30 April 1993

Pages:385 - 388 vol.1

[\[Abstract\]](#) [\[PDF Full-Text \(296 KB\)\]](#) IEEE CNF

2 Parasitic characteristics of BGA packages

Chang, T.; Cheng, P.H.; Huang, H.C.; Lee, R.S.; Lo, R.;
IC/Package Design Integration, 1998. Proceedings. 1998 IEEE Symposium on Feb. 1998

Pages:124 - 129

[\[Abstract\]](#) [\[PDF Full-Text \(748 KB\)\]](#) IEEE CNF

3 A 2.5 GHz BiCMOS transceiver for wireless LAN

Meyer, R.G.; Mack, W.D.; Hageraats, J.J.E.M.;
Solid-State Circuits Conference, 1997. Digest of Technical Papers. 44th ISSCC 1997 IEEE International , 6-8 Feb. 1997

Pages:310 - 311, 477

[\[Abstract\]](#) [\[PDF Full-Text \(1172 KB\)\]](#) IEEE CNF

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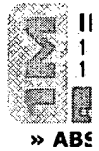
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Design and VLSI implementation of a novel concurrent multiplier-accumulator for DSP applications

Poornaiah, D.V. Haribabu, R. Ahmad, M.O.

Indian Telephone Ind. Ltd., Bangalore, India;

This paper appears in: Acoustics, Speech, and Signal Processing, 1993. : 93., 1993 IEEE International Conference on

Meeting Date: 04/27/1993 - 04/30/1993

Publication Date: 27-30 April 1993

Location: Minneapolis, MN USA

On page(s): 385 - 388 vol.1

Volume: 1

Reference Cited: 20

Inspec Accession Number: 4754281

Abstract:

The authors propose an efficient carry-save algorithm based on the Baugh-Wooley transformation technique and map it onto a novel concurrent multiplier-accumulator (CMAC) architecture that can be configured on-the-fly for **selecting** multiply-multiply-add/subtract computations involving unsigned/**signed** 2's complement mode data formats. The proposed CMAC does not require the use of a separate module, thereby achieving a reduction of 50% in the computation time along with savings in the area when compared with the conventional MACs. The CMAC, while maintaining functional as well as near total **pin** compatibility with the industry MACs, such as the ADSP1010 and TDC 1010 series, provides additional features: mixed-mode data format, saturation arithmetic logic, and on-chip test logic for measurement of the critical **path** delay. A 16×16 CMAC based on carry-save look-ahead techniques is designed and was extensively simulated with a cycle time using 1 μm CMOS gate array technology rules.

Index Terms:

16 bits Baugh-Wooley transformation CMOS gate array technology CMOS integrated circuits DSP VLSI VLSI implementation area carry logic carry look-ahead techniques computation time concurrent multiplier-accumulator critical path delay digital processing chips logic design mixed-mode data format on-chip test logic pin compatibility saturation arithmetic logic 16 bits Baugh-Wooley transformation CMOS gate array technology CMOS integrated circuits DSP VLSI VLSI implementation area carry logic carry

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File: PGPB

Feb 26, 2004

PGPUB-DOCUMENT-NUMBER: 20040039863

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040039863 A1

TITLE: Spare input/output buffer

PUBLICATION-DATE: February 26, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Isom, Melvin T. III	Durham	NC	US	
Hegde, Shailesh U.	Cary	NC	US	

US-CL-CURRENT: [710/305](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw Data
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☐ 2. Document ID: US 6738858 B1

L6: Entry 2 of 5

File: USPT

May 18, 2004

US-PAT-NO: 6738858

DOCUMENT-IDENTIFIER: US 6738858 B1

TITLE: Cross-bar matrix for connecting digital resources to I/O pins of an integrated circuit

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw Data
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☐ 3. Document ID: US 5799036 A

L6: Entry 3 of 5

File: USPT

Aug 25, 1998

US-PAT-NO: 5799036

DOCUMENT-IDENTIFIER: US 5799036 A

TITLE: Computer system which provides analog audio communication between a PC card

h e b b g e e e f e g e f b e

and the computer's sound system

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMIC	Draw D
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☐ 4. Document ID: US 5752082 A

L6: Entry 4 of 5

File: USPT

May 12, 1998

US-PAT-NO: 5752082

DOCUMENT-IDENTIFIER: US 5752082 A

TITLE: System for multiplexing pins of a PC card socket and PC card bus adapter for providing audio communication between PC card and computer sound system

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMIC	Draw D
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☐ 5. Document ID: US 4300207 A

L6: Entry 5 of 5

File: USPT

Nov 10, 1981

US-PAT-NO: 4300207

DOCUMENT-IDENTIFIER: US 4300207 A

TITLE: Multiple matrix switching system

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMIC	Draw D
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US006058252A

United States Patent [19]

Noll et al.

[11] Patent Number: 6,058,252

[45] Date of Patent: May 2, 2000

[54] SYSTEM AND METHOD FOR GENERATING EFFECTIVE LAYOUT CONSTRAINTS FOR A CIRCUIT DESIGN OR THE LIKE

[75] Inventors: Mark D. Noll, Santa Clara, Calif.; Kenneth E. Scott, Sherwood, Oreg.; Robert L. Walker, Boulder, Colo.

[73] Assignee: Synopsys, Inc., Mountain View, Calif.

[21] Appl. No.: 08/910,803

[22] Filed: Aug. 13, 1997

Related U.S. Application Data

[63] Continuation of application No. 06/375,453, Jan. 10, 1995, abandoned.

[51] Int. Cl.⁷ G06F 9/453; H01L 21/70

[52] U.S. Cl. 392/306; 364/490; 364/491

[58] Field of Search 364/488, 489, 364/490, 491, 378, 393/500

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Primary Examiner—Kevin J. Toke

Assistant Examiner—Dan Fiel

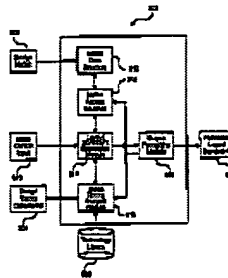
Attorney, Agent, or Firm—Kotlich, Hartwell, Dickinson, McCormick & Heuser

[57]

ABSTRACT

A computer system and computer implemented method for deriving constraints with which to direct automatic integrated circuit layout is disclosed. The present invention is particularly adapted for use in the design of large integrated circuits with complex synchronous timing behavior. Preferably, the invented computer system includes means for storing a netlist data structure within a storage means is provided, the netlist data structure representing a circuit configuration having a plurality of circuit elements and representing static timing information for the circuit configuration; means for selecting specified circuit elements to be used for generating the layout constraints, whereby the specified circuit elements that are selected are fewer than, i.e. represent a proper subset of, the plurality of circuit elements of the circuit configuration; means for identifying a most critical path through each of the specified circuit elements based upon the static timing information, whereby preferably the most critical path is that path having the least slack defined as the difference between a required time at which a signal should reach the specified circuit element and an arrival time at which the signal is expected to reach the specified circuit element; and means for generating layout constraints from the most critical path through each of the specified circuit elements, whereby at least one constraint is generated covering each of the specified circuit elements. Also disclosed is a feature whereby any paths that do not meet specified filter criteria, and paths that are duplicates of others, are discarded, thereby retaining only irredundant critical paths on which to base layout constraints.

16 Claims, 17 Drawing Sheets



Previous patent



US005774793A

United States Patent ^[19]

Cooper et al.

[11] Patent Number: **5,774,793**

[45] Date of Patent: **Jun. 30, 1998**

[54] **SYSTEM AND METHOD FOR INTERFACING DIVERSELY CONTROLLED DEVICES TO A BUS CONNECTOR HAVING A COMMON SIGNAL FORMAT**

[75] Inventors: **Gershon N. Cooper, Rodino; Andrew Holman, West Hills, both of Calif.**

[73] Assignee: **ORA Electronics, Inc., Chatsworth, Calif.**

[21] Appl. No.: **361,983**

[22] Filed: **Dec. 23, 1994**

[51] Int. Cl.⁶ **H04B 1/38**

[52] U.S. Cl. **455/89; 455/345; 455/127; 379/59; 439/502; 439/555**

[58] Field of Search **455/89, 90, 127, 455/128, 344, 345, 346, 347, 348, 349, 350, 351, 351.1; 379/58, 59, 63, 441, 442; 439/502, 636, 505, 555**

[36] **References Cited**

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Primary Examiner—Reinhard J. Eisenkopf

Assistant Examiner—Dennis To

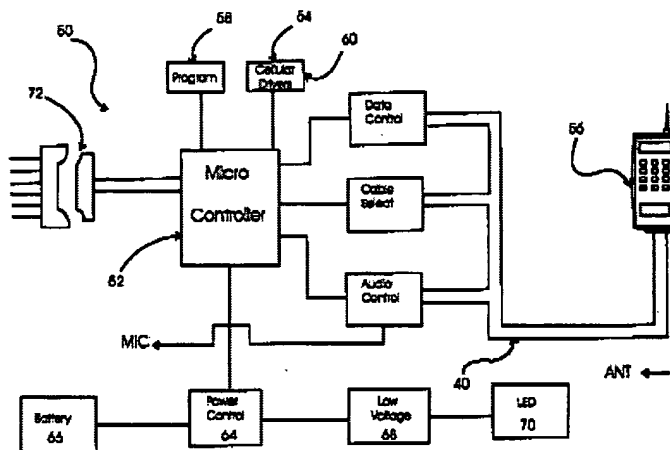
Attorney, Agent, or Firm—Matthew R. Jodanewicz

[37]

ABSTRACT

A system for connecting a plurality of cellular telephones, each responsive to device-specific command signals for its operation, to an automotive electronics and communications system through a bus connector having a known universal signal format, includes a docking station having a cradle member shaped for receiving at least one cellular telephone. An interface unit contains the hardware and firmware drivers necessary for controlling the selected cellular telephone. A user selected cable having a specific signal path configuration selects the needed drivers. A second cable connects the interface unit with the bus connector for communicating signals therebetween.

41 Claims, 4 Drawing Sheets



United States Patent [19]

Whetzel

[11] Patent Number: 5,056,093

[45] Date of Patent: Oct. 8, 1991

[54] SYSTEM SCAN PATH ARCHITECTURE

[73] Inventor: Lee D. Whetzel, Plano, Tex.

[73] Assignee: Texas Instruments Incorporated, Dallas, Tex.

[21] Appl. No.: 891,781

[22] Filed: Aug. 9, 1989

[51] Int. Cl. G01R 31/28

[52] U.S. Cl. 371/22.3; 371/22.1

[56] Field of Search 371/22.3, 22.1; 324/73.1

[56] References Cited

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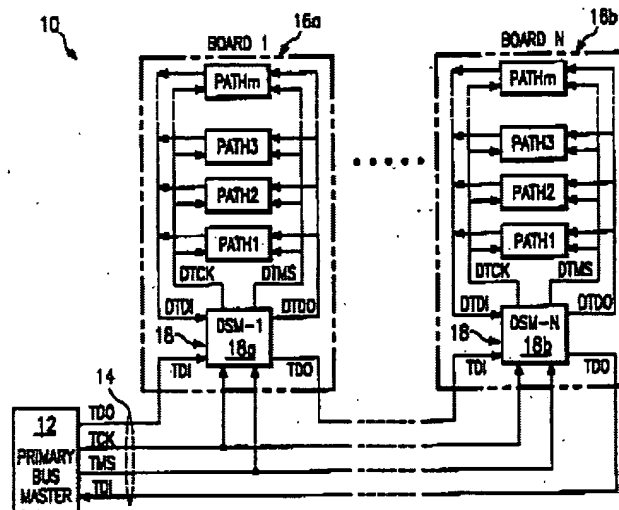
4,872,169 10/1989 Whetzel 371/22.3

Primary Examiner—Charles E. Addison
Attorney, Agent, or Firm—B. Peter Bernick; James T. Comfort; Melvin Sharp

[57] ABSTRACT

A system scan path architecture is provided by a device select module (DSM) (18) which may be used in conjunction with associated circuits (16a-b) to select secondary scan paths (PATH1-m) on each circuit for coupling with a primary scan path on a test bus (14). The test bus (14) is controlled by a primary bus master (12). Remote bus masters (12a) may be used in conjunction with the DSMs (18) to provide serial-scan testing independent of the primary bus master (12).

41 Claims, 11 Drawing Sheets



United States Patent (19)

Jackson

3,922,537
Nov. 25, 1975

[54] MULTIPLEX DEVICE FOR AUTOMATIC TEST EQUIPMENT

[75] Inventor: Philip C. Jackson, Mahwah, N.J.
[73] Assignee: Instrumentation Engineering, Inc., Franklin Lakes, N.J.

[22] Filed: Sept. 26, 1974

[31] Appl. No.: 509,993

[52] U.S. Cl. 235/185 AC; 324/73 R
[51] Int. Cl. G01R 31/28
[58] Field of Search 235/153 AC; 324/73 R; 324/73 AT; 340/172.5

[56] References Cited

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E-M Research Laboratories, Inc., 4500/4600 Series Automated Test Systems, pp. 11-17.

Primary Examiner—R. Stephen Diklan, Jr.
Attorney, Agent, or Firm—Morgan, Finnegan, Pina, Foley & Lee

[37] ABSTRACT

The present invention pertains to multiplex apparatus for an automatic computerized diagnostic testing system for selectively interconnecting peripheral measurement and stimulus devices to a unit under test (UUT) through various switching subsystems which differ in switching capability, load carrying ability, frequency bandwidth, and mode of operation. The multiplexer includes plural conducting means between each pin of the circuit under test and corresponding terminals or test points of plural switching subsystems used to interconnect UUT pins and the peripheral testing devices. Each plural conducting means includes controllable switch means. These switch means operate automatically under programmed computer control. One of the switching subsystems has high frequency signal carrying ability, and the conducting means associated with this subsystem preferably include impedance matching buffers, and have a frequency bandwidth equal to that of the subsystem.

13 Claims, 7 Drawing Figures

